

<b>Report Documentation Page</b>			Form Approved OMB No. 0704-0188	
<p>Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p>				
1. REPORT DATE <b>DEC 2004</b>	2. REPORT TYPE	3. DATES COVERED <b>00-10-2004 to 00-12-2004</b>		
<b>4. TITLE AND SUBTITLE</b> <b>'One-Stop' Waste Disposal - Enhancing Force Protection in Afghanistan (Engineer, Volume 34, PB 5-04-4, October-December 2004)</b>			5a. CONTRACT NUMBER	
			5b. GRANT NUMBER	
			5c. PROGRAM ELEMENT NUMBER	
<b>6. AUTHOR(S)</b>			5d. PROJECT NUMBER	
			5e. TASK NUMBER	
			5f. WORK UNIT NUMBER	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> <b>Engineer Professional Bulletin,MANSCEN Directorate of Training,464 MANSCEN Loop, Suite 2661,Fort Leonard Wood,MO,65473-8926</b>			8. PERFORMING ORGANIZATION REPORT NUMBER	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>			10. SPONSOR/MONITOR'S ACRONYM(S)	
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
<b>12. DISTRIBUTION/AVAILABILITY STATEMENT</b> <b>Approved for public release; distribution unlimited</b>				
<b>13. SUPPLEMENTARY NOTES</b>				
<b>14. ABSTRACT</b>				
<b>15. SUBJECT TERMS</b>				
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b> <b>Same as Report (SAR)</b>	<b>18. NUMBER OF PAGES</b> <b>3</b>
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>		

# **"One-Stop" Waste Disposal – Enhancing Force Protection in Afghanistan**

*By Lieutenant Colonel Garth Anderson and Lieutenant Colonel Whitney Wolf*

**S**ound environmental practices in the theater of operations, principally hazardous and solid waste management, are truly an area of force protection. How much waste can a contingency base camp generate? Seemingly more than it can handle. By Spring 2002, units at Kandahar Airfield, Afghanistan, were faced with a growing human health and environmental threat caused by huge amounts of waste that required collection, management, and disposal. This waste, not just from US forces, included vast amounts of destroyed equipment, trash, and hazardous waste left behind by Taliban forces that were routed away from the airfield.

## **Uncontrolled Waste Disposal**

**D**uring the initial stages of base camp development, there were no easy disposal solutions. Most of the land in and around the airfield was potentially laden with mines and unexploded ordnance (UXO), which meant waste collection, consolidation, and disposal activities were limited to cleared locations close to soldier living and work areas within the camp. Off-site disposal was not an option since the local population was still unfriendly, and local disposal facilities did not exist. The first disposal area at the airfield consisted of a shallow trash burn pit surrounded by a large junkyard of old Soviet equipment, barrels of hazardous waste, discarded US materiel, trash, and small-caliber ammunition. This disposal site was uncontrolled, and many



**Hazardous waste disposal at the old burn pit**

items—regardless of their potential hazard or reuse value—were thrown into or around the burn pit. The uncontrolled nature of the disposal area created a number of unacceptable conditions:

- Soldiers entering the area to dispose of waste were at risk for potential exposure to smoke from burning debris, exploding aerosol cans and food containers, and unknown hazardous waste.
- The burn pit's proximity to the center of the camp allowed smoke to drift over living and work areas, creating a potential risk to soldier health.
- Hazardous waste (primarily petroleum, oil, and lubricant [POL] products) was uncontained, allowing the possible leaching of contaminants into the groundwater. Since the airfield depended on a single well to supply all of its nonpotable and most of its potable water, this threat was unacceptable.
- Soldiers threw nonburnable debris into the burn pit, causing it to fill up quickly and resulting in the need to dig a new emergency pit.
- Units discarded and destroyed large amounts of reusable or recyclable material (such as lumber, vehicle parts, equipment, metals, and concertina wire).
- The area was used for improper disposal of medical waste.



**Abandoned Soviet military equipment near the old burn pit**

In April 2002, Facility Engineer Team (FET) 18 of the US Army Facility Engineer Group (USAFEG) arrived at Kandahar Airfield and joined the staff of the Brigade Combat Team. The FET was manned by seven engineering, environmental, and construction professionals and was augmented by a US Army Corps of Engineers liaison officer. After setting up public works operations at the camp, the FET and the brigade staff began preparing the base master plan. A key component of this plan was environmental management, especially the collection and disposal of hazardous and solid waste. Given the conditions of the waste disposal area, commanders agreed that environmental management was a force protection issue and gave it the appropriate priority.

Several challenges faced the FET as it gained control over the waste management issues:

- Land for a new disposal area had to be cleared of mines and UXO.
- An upcoming transfer of authority between Brigade Combat Teams meant that departing units would be generating enormous amounts of waste as they cleaned and loaded equipment.
- Large amounts of improperly disposed of hazardous waste still needed to be collected and contained.

### Controlled Waste Disposal

The environmental officers on the FET developed a plan that effectively balanced simplicity with effectiveness. First, the new disposal area needed to be as far away from the main part of the camp as possible to minimize exposure to smoke. Second, sound waste disposal needed to be easy. If it is too difficult and complex to comply with the requirements, then midnight dumping occurs, making the problem even worse. The basic concept became “one-stop shopping” for all disposal requirements—all forms of waste disposal located in one spot. This allowed a logical and controlled process that made it easy for units to comply. This facility, with easy access from the road, consisted of a recycling area, hazardous waste storage cells, a medical waste incinerator, and a large burn pit with controlled access.

#### Usable Materials

The first stop at the facility was the recycling area where units dropped off potentially usable materials, especially lumber and scrap metal. This provided numerous benefits to the camp—units could reuse these materials for building furniture, packing for shipping, fabricating parts, and repairing equipment. Lumber was scarce and expensive, and this was a great cost saving and a relief on resupply channels. And keeping the nonburnable material out of the burn pit greatly extended the life of the pit.

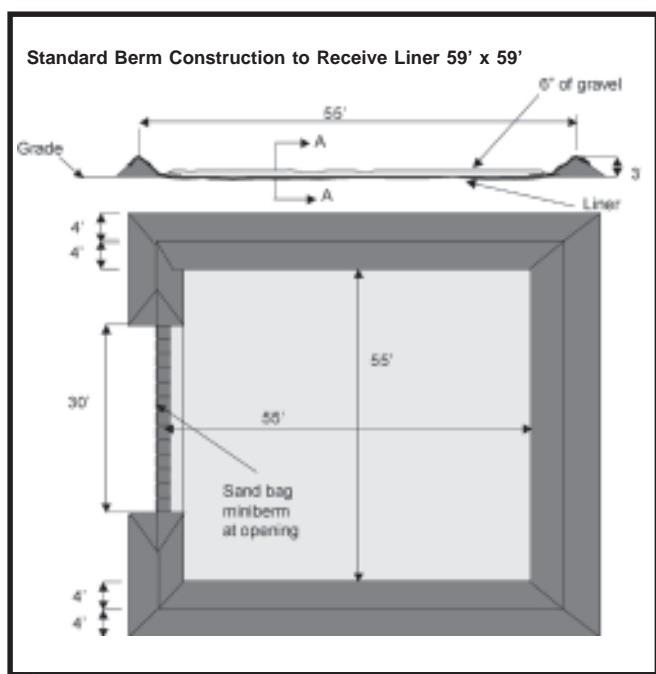
#### Hazardous Waste

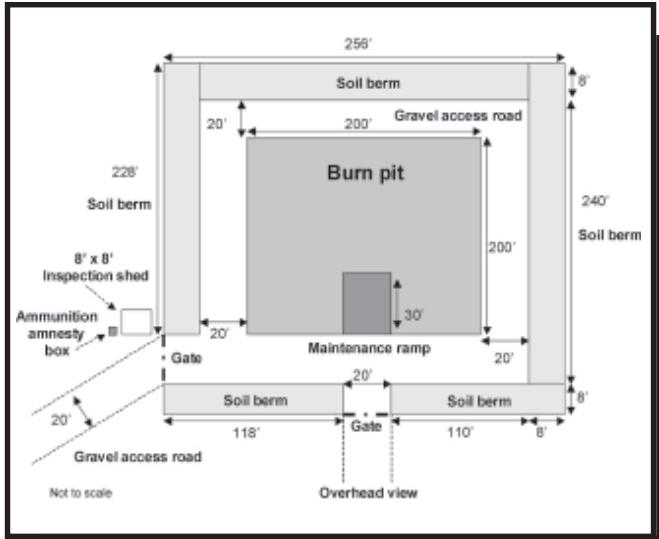
The next stop was the hazardous waste holding area. This facility consisted of six bermed and lined cells, each 40 by 40 feet. Liners for the cells were unserviceable fuel bladders that



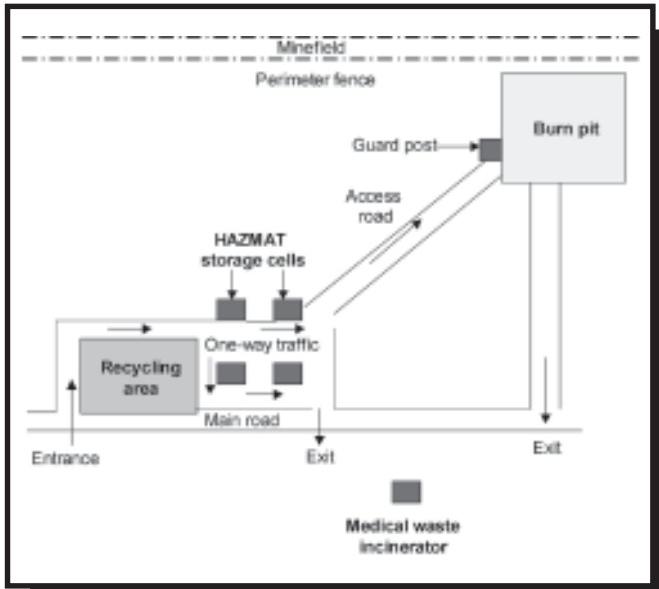
**Soldiers dumping at the old burn pit were exposed to hazards of burning trash.**

were drained, cut open, dried, laid flat, and covered with gravel. Soldiers then placed each type of waste (such as POL, batteries, and solvents) into separate designated cells, to comply with segregation requirements. Labeling standards were minimal to maintain simplicity and facilitate compliance with proper storage. Waste characterization, labeling, and preparation for shipment would be a task for the future base support contractor. Final disposal of hazardous waste would come later when a theaterwide disposal contract was in place. But until that time, the waste was effectively segregated, contained, and away from troop living and work areas.





New burn pit design



Layout of the one-stop waste disposal area

### Burn Pit

Once all reusable materials and hazardous waste were dropped off, the unit vehicle could then proceed to the burn pit. The FET incorporated several features into the design and construction of the pit. Most importantly, it was controlled. The pit was surrounded by a berm and barbed wire, and the single point of entry was gated and manned by a guard, who inspected loads to ensure that only appropriate waste was placed in the pit. The entry also featured an ammunition amnesty box, which kept hundreds of dangerous rounds from being placed in the fire. The burn pit (250 by 250 feet in area and 12 feet deep) was large enough to have a reasonable life span of 2 to 3 years. The large size allowed safe standoff between areas of the pit that were actively burning or smoldering and designated spots where units would dump

their loads, minimizing the likelihood of an injury from exploding debris. An entrance ramp allowed access by dozers and compactors to perform routine maintenance, also extending the life of the pit.

### Medical Waste

Requirements for disposal of medical waste are more stringent than those for solid waste due to the potential biohazard of medical waste. Therefore, a small incinerator for medical waste was placed adjacent to the disposal area. The base support contractor was responsible for the operation and maintenance of the incinerator.

### Conclusion

**T**ying the entire waste management program together required the vigilance of the unit chain of command and the base operations staff. As a result of the experience gained in its peacetime mission of environmental assessments at US Army Reserve Centers nationwide, the FET was able to provide expert environmental staff work. The FET also acted as the commander's eyes and ears to ensure that soldiers were complying with unit and Army environmental standards.

Sound environmental management in contingency operations is an important facet of force protection. It is necessary to minimize soldier exposure to potentially harmful contaminants and hazardous conditions at uncontrolled waste disposal areas and burn pits. To facilitate good waste disposal practices, the process needs to incorporate simplicity for the soldier and the unit, design and construction of facilities that provide access control and waste containment, and continuous enforcement by the chain of command. A properly designed and built one-stop waste disposal facility is a key component of a good environmental program that helps soldiers remain healthy and able to accomplish their critical mission outside the wire.

*Lieutenant Colonel Anderson is the Commander, 733d Facility Engineer Detachment, Kansas City, Missouri. He was the team leader of FET 18, USAFEG, Kandahar, Afghanistan, and has served as S3 of 2d Brigade, 383d Training Support Battalion, as well as civil and mechanical engineer positions in the USAFEG. Lieutenant Colonel Anderson holds a bachelor's in civil engineering from the US Military Academy and a master's in environmental engineering from the University of Illinois.*

*Lieutenant Colonel Wolf is the team leader of FET 16, Omaha, Nebraska. He was the operations and environmental officer, FET 18, USAFEG, Kandahar, Afghanistan. He has held civil and mechanical engineer positions in USAFEG and was an operations research/systems analyst at Fort Leonard Wood, Missouri. Lieutenant Colonel Wolf holds a degree in civil engineering from Missouri Western State College.*